



Combined Heat and Power Systems for Oregon



OREGON OFFICE
OF ENERGY

Agenda

- ◆ **Oregon Office of Energy role and services**
- ◆ **Why promote Combined Heat and Power?**
- ◆ **Oregon status report**
- ◆ **State incentives for high efficiency systems**
- ◆ **Advancing combined heat and power**
- ◆ **History of involvement**
- ◆ **Other resources**

Mission

The mission of the Oregon Office of Energy is to protect Oregon's environment by saving energy, developing clean energy resources and cleaning up nuclear waste.

Goals

- ◆ **Conservation and renewable resources meet a significant portion of Oregon's incremental energy needs.**
- ◆ **Carbon dioxide emissions from burning fossil fuels are reduced 1 percent per year.**
- ◆ **The state and counties within 50 miles of an operating commercial nuclear power plant are prepared for nuclear safety emergencies.**
- ◆ **Key cleanup milestones at the Hanford Nuclear Reservation are achieved.**

Services for Combined Heat and Power Systems

- ◆ Demonstrating new technologies and practices
- ◆ Technical and financial help
- ◆ Project financing: \$30,000 to \$30 million
- ◆ Tax credits
- ◆ Access to federal programs and expert referral

Why Promote Combined Heat and Power?

Electricity Is Needed for Growing Loads

- ◆ Sales grew 1.9% per year from 1980 to 2000
- ◆ Two decades of population growth above national average
- ◆ Electricity use will grow as economy recovers

Combined Heat and Power Is Part of Least-Cost Mix

- ◆ Most new generation is gas-fired
- ◆ Most of the cost is fuel price
- ◆ Combined heat and power is the most efficient gas-fired resource
- ◆ Can reduce transmission and distribution system upgrades
- ◆ Reduces line losses

Benefits for Customers

- ◆ Improves power reliability
- ◆ Provides on-site power quality control
- ◆ Provides another way to respond to high power prices
- ◆ Can sell excess generation, capacity or ancillary services
- ◆ High efficiency systems reduce CO₂ emissions

Oregon Distributed Generating Resources

- ◆ Systems over 25 MW require state siting or exemption
- ◆ Most resources are at industrial sites
- ◆ Most small systems are for backup or uninterrupted power supply
- ◆ Net metering for solar, wind, hydro and fuel cells under 25 kW
- ◆ Energy is finalizing model siting standards for local ordinances
- ◆ Interconnection standards and agreements vary among utilities, and projects over 1 MW are negotiated individually (for IOUs)
- ◆ Installed equipment costs and standby charges are barriers

Oregon Distributed Generating Resources

- ◆ 40 distributed generation systems over 100 kW (Does not include emergency generators or landfill gas/biomass run as central station)
- ◆ Up to 50 MW capacity
- ◆ About 500 MW total installed capacity
- ◆ More than 100 MW of that capacity is idle
- ◆ 18 plants fired by wood or black liquor
- ◆ 12 natural gas-fired systems
- ◆ Nine wastewater treatment plants that use methane gas
- ◆ Oldest operating plant built in 1955; most built in the mid-1980s

Oregon Incentives for Combined Heat and Power

Financing

- ◆ Loans available for entire cost
- ◆ Fixed rates over five, 10 or 15 years

Tax Credits (tiered)

- ◆ 35% tax credit for heat rate of 6,200 Btu/kWh or lower
(10% better than Oregon CO₂ standard for power plants)
- ◆ Full cost eligible for systems 5,700 Btu/kWh or lower
(60% overall system efficiency)

Technical Assistance

Financing

Energy Loan Program

- ◆ \$307 million portfolio (year-end 2001)
- ◆ Efficiency (incl. heat recovery), renewable resources, recycling
- ◆ Fixed rates of 6.5% and 8%
- ◆ Terms of five, 10 or 15 years
- ◆ General obligation bonds A+ rated
- ◆ Public projects and renewable resource tax-exempt bond rates



OREGON OFFICE
OF ENERGY

Incentives for Efficiency

Businesses



OREGON OFFICE
OF ENERGY

Tax Incentives

Business Energy Tax Credit

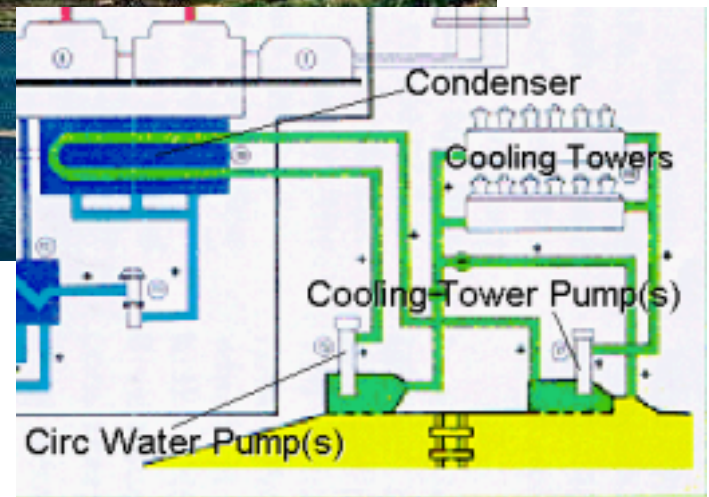
- ◆ >5,800 completed projects (year-end 2001)
- ◆ Energy savings in 2001: \$145 million
- ◆ Energy efficiency, recycling, transportation, renewable resources
- ◆ 35% credit against Oregon excise taxes owed
 - \$1 million project = \$350,000 credit against taxes owed
- ◆ Project pre-certification in 10 business days



OREGON OFFICE
OF ENERGY

Incentives for Efficiency

Industry



OREGON OFFICE
OF ENERGY

Tax Incentives

Residential Energy Tax Credit

- ◆ Up to \$1,500 tax credit for solar, wind and geothermal
- ◆ Premium efficiency appliances
- ◆ Hybrid gas-electric and alternative fuel vehicles
- ◆ High efficiency heating, ventilating and air conditioning equipment
- ◆ Fuel cells



OREGON OFFICE
OF ENERGY

Incentives for Efficiency

Residential



- ◆ High efficiency appliances
- ◆ Efficient HVAC
- ◆ Solar, wind, geothermal
- ◆ Fuel cells

Incentives For Efficiency

Transportation

- ◆ Transit passes
- ◆ Telework



- ◆ Hybrid gas-electric vehicles
- ◆ Clean burning fuels



OREGON OFFICE
OF ENERGY

History of Oregon Efficiency Incentives and Services

- ◆ 1974: Energy standards for homes
- ◆ 1977: Residential Alternative Energy Device Tax Credit
- ◆ 1978: Energy standards for commercial buildings
- ◆ 1978: Business Energy Tax Credit
- ◆ 1979: Small Scale Energy Loan Program established
- ◆ 1988: Industrial Assessment Center
- ◆ 1996: Oregon Manufacturing Extension Program
- ◆ 1999: Net metering legislation
- ◆ 2002: Stable funding for conservation, renewables for 10 years

Climate Change Activities

- ◆ 1988: Governor's task force
- ◆ 1991: Oregon directs CO₂ reduction
- ◆ 1992: Benchmark for CO₂ established
- ◆ 1995: Oregon CO₂ reduction strategy
- ◆ 1997: Oregon power plant standard
- ◆ 1999: Global warming education campaign
- ◆ 2000: Governor's sustainability order



Advancing Combined Heat and Power

Policies

- ◆ Local jurisdictions adopt model siting standards for small systems
- ◆ Utilities adopt uniform interconnection standards and agreements
- ◆ Review standby rates for backup and supplemental power
- ◆ Include distributed generation in distribution system planning
- ◆ Adopt tariffs for moving power for sale over distribution system
- ◆ Decouple utilities' revenue requirements from kWh throughput

Marketplace

- ◆ Informed engineering community and jurisdictions
- ◆ Turnkey installations
- ◆ Affordable technology

Other Oregon Resources

Utilities

- ◆ Technical assistance
- ◆ Net metering for solar, wind, hydro and fuel cells
- ◆ Some financial assistance

Industry

- ◆ Experienced engineering community
- ◆ Oregon manufacturers of reformers, fuel cells and other CHP systems
- ◆ Local suppliers of fuel cells, microturbines, and IC engines
- ◆ 200 Market Street Consortium

Other Oregon Resources

- ◆ Oregon State University Industrial Assessment Center
- ◆ Oregon Manufacturing Extension Partnership
- ◆ Oregon Department of Environmental Quality
- ◆ Bonneville Power Administration and public utilities
- ◆ U.S. Department of Energy
- ◆ Industry associations
- ◆ NW Natural
- ◆ Pacific Power
- ◆ Portland General Electric
- ◆ Idaho Power



OREGON OFFICE
OF ENERGY

- ◆ Oregon has improved energy efficiency and limited CO₂ emissions without harming the economy.
- ◆ Education, standards, technical assistance and incentives are key.
- ◆ Conservation and renewables are the state's preferred resources.
- ◆ A robust marketplace will further develop combined heat and power technologies.



OREGON OFFICE
OF ENERGY

Contact Information:

- ◆ Marty Stipe, energy analyst
503-378-4926
marty.stipe@state.or.us
- ◆ Lisa Schwartz, policy analyst
503-378-8356
lisa.c.schwartz@state.or.us
- ◆ Toll-free in Oregon: 1-800-221-8035
- ◆ Web site: www.energy.state.or.us



OREGON OFFICE
OF ENERGY